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ABSTRACT

This paper describes the chess program for elementary school students in the Daviess County School District, Kentucky. The Critical Thinking committee of the school system's Graduation 2010 initiative explored various ways to promote critical thinking in the classroom and arrived at a program to put chess boards in the classrooms and to encourage student, and teacher, participation. The program begins with kindergarten students. Because many teachers did not play chess themselves, the school district developed a manual and a teaching aid so that chess could be taught in the school. As implemented, the program is to be a 5-year curriculum plan with implementation through five stages. (SLD)

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Graduation 2010:
The Chess Component of Critical Thinking

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Graduation 2010: The Critical Thinking Component

Introduction

The Critical Thinking component for Daviess County Public School's Graduation 2010 is one of four strands dedicated to the goal of enhancing student learning capacity. The task of the Critical Thinking committee was to identify strategies and materials for classroom use that focus on critical thinking skills across multiple grade levels. In keeping with a basic premise on how the brain learns best, it was important for the committee to select strategies and materials that provide both motivating and challenging learning experiences for students. The committee delved into research searching for two things: 1) Critical thinking programs that compliment the current curriculum focus in the Daviess County School District, and 2) Materials that reinforce higher-order thinking skills. From their findings, one program and one strategy emerged as the most promising: Talents Unlimited and chess. For the purpose of this report chess is the subject at hand.

Prior to Graduation 2010 only a handful of chessboards were in classrooms across the Daviess County School District. There was no effort to train teachers in the game of chess nor was there encouragement to purchase chess sets as a part of basic instructional materials. As a matter of fact, few teachers knew the rules of chess and simply did not consider the importance of learning the game themselves or the instructional merit of teaching it to their students.

The findings of the Critical Thinking Skills Committee sparked an epiphany for the school district. Presently, all elementary classrooms are equipped with chess sets. (Additionally, both high schools have formed chess clubs.) It is also not uncommon for

elementary teachers to use chess as an incentive -- to grant permission for students to play chess after they complete their class work. The influence of chess is expanding.

Review of Literature

Dullea (1982) states that "...we have scientific support for what we have known all along – chess makes kids smarter!" (Chess Life, November, p. 16) That premise explains why chess is included in a curriculum designed to enhance brain capacity. Supporting research dates back to 1925 when Djakow, Petrowski, and Rudik studied grandmasters to determine the underlying factors of chess talent (Christiaen, 1976). These early researchers determined that high achievement in chess is based on exceptional visual memory, combination power, speed of calculation, and power of concentration. Playing chess well requires extensive use of higher-order thinking skills.

Since the early studies on grandmasters, numerous studies support the premise that chess enhances cognitive development. Chess promotes logical thinking, instills a sense of self-confidence and self-worth, and improves communication and pattern recognition skills. Evidence of these assertions includes a 5-year study of 53 students in grades 7-9. To judge the impact of chess on thinking skills these students completed the Watson-Glaser Critical Thinking Appraisal and the Torrance Tests of Creative Thinking at the beginning of the project in which they received chess instruction. Alternate forms of the tests were administered at the end of each subsequent school year. Results indicated that chess had a significant impact on developing analytical thinking skills. There was also significant growth in creative thinking as measured by the Torrance Test of Creative Thinking (Ferguson, undated).

In the early 1980's the Venezuelan government authorized the study of 4,266 second grade students to determine if chess could be used to develop the intelligence of children. Results on the Wechsler Intelligence Scale for Children showed that both male and female children exhibited an increase of intelligence quotient (IQ) after less than a year of studying chess (Dickinson, 1983). These findings suggest that the systematic thinking and practice of chess significantly impacts the intelligence quotient -- chess develops a new form of thinking, and this exercise is what contributes to increasing the intelligence quotient. In addition, the development of intelligence through the practice of a game creates a new form of abstract exercise which is self-motivating (Tudela, undated).

Christiaen (1976) used chess to test Piaget's theory about cognitive development. Piaget holds that an important growth period occurs approximately between the ages of 11 and 15 – when the movement from the "concrete" stage to the "formal" stage occurs. Christiaen used chess to enrich the environment for 20 fifth grade boys who received 42 one-hour chess lessons. There was a control group of like number and grade. He used a "posttest only' study to see if the test group progressed further towards the formal stage than the control group. Findings from Piaget tests (i.e., balance test and liquid test) support Christiaen's premise that chess instruction does, in fact, enhance cognitive development.

The Theory Behind Daviess County's Chess Program

The youngest students involved in the research cited thus far are in the second grade. The Daviess County Public Schools chooses to implement a chess program beginning with kindergarten children realizing through recent findings in brain research that children are born possessing their maximum number of neurons. Brain activity (electrochemical processes) "shows a rapid growth between infancy and approximately age ten." (Parry &

Gregory, 1993) It is important that children engage in stimulating and challenging activities that assist the process of networking between neurons. Teaching a child to play chess at an early age engages the neurons in the portion of the brain responsible for Math/Logic. Firing neurons in this portion of the brain inhibits their loss in the early adolescent years when the brain begins the process of pruning unused neurons.

Implementing the Program

The Critical Thinking component of Graduation 2010 embraces learning the game of chess as one strategy to enhance higher order thinking skills. The Critical Thinking Skills Committee proposal calls for elementary teachers in Daviess County, grades K-5, to teach chess to the students in their classroom. The proposal, however, fails to make provisions for teachers that lack knowledge of the game. Unfortunately, many teachers did not have the means to initiate this component -- they could not teach their students how to play chess.

Finding it difficult to learn how to play chess themselves and to locate appropriate teaching materials for students at the same time was cumbersome. Individually, some teachers faced the possibility of failure to implement a teaching program for chess and as a result the district program was at risk. The district searched unsuccessfully to locate chess resources for educating teachers or students. To compensate for the lack of materials teachers experimented with different whole group strategies. Many learned that efforts to teach a class with only one store bought chess game were efficient and ineffective. Even small group instruction within the classroom was difficult and frustrating to manage. It was evident that teachers needed a large visual aid chessboard to facilitate whole group instruction, enhance learning and efficiently manage classroom. Teachers needed to implement the "modeling" and "guided practice" elements of a well-planned lesson.

To meet her own needs and those of her colleagues, Cathy Willis Englehardt, organized the **Teacher Made Chess Board Game** and authored the accompanying teacher manual. The game consists of a velcro, poster size chess board and game pieces. The format of this game allows teachers to conduct whole class instruction and retain the elements of an effective lesson. The manual serves to instruct the teacher and student simultaneously. It organizes critical information for learning chess and presents it in a program that allows students to learn the game over time. The method used has a spiraling effect, much like math, which builds learning from grade level to grade level.

The manual, **Teaching Chess in the Elementary Grades,** is recommended as a five-year curriculum plan with implementation occurring through five phases. The plan outlines the content in each phase. The game is broken down into small increments allowing for simplification and developmentally appropriate lessons for students. Each phase builds upon the previous phase learned. Teachers have the flexibility to move students through different phases as their students display the understanding and readiness to advance. Teachers comment that the curriculum works well because it takes students from a simple concept and builds to the more complex ones. The goals of the five-year curriculum plan for teaching chess elementary grades are:

1) To enhance critical thinking skills in students at an early age;

2) To ensure a scope and sequence chess curriculum between grade levels;

3) To give direction and add simplicity to lesson planning;

4) To minimize classroom management; and

5) To teach all students the basic fundamentals of the game of chess.

"5 Year Plan" Curriculum Alignment

	Pieces	*King*	*Pawns*	*Rooks*	*Bishops*	*Knights*	*Queen &*
	Set-Up						*Basic Strategy*
Phase I	I	I	I				
Phase II	R	R	R	I			
Phase III	R	R	R	R	I		
Phase IV	R	R	R	R	R	I	
Phase V	R	R	R	R	R	R	I

(I) Introduce

(R) Review

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